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ABSTRACT

In early transformational generative grammar, it was assumed that all semantic interpretation would be done off deep structure, but with the proposals for the extended standard theory (EST) of Chomsky (1968, 1972) came the realization that certain aspects of semantic interpretation, such as focus and presuppostion and scope of quantifiers, must be done off surface structure. More recent developments suggest that EST did not go far enough. Given trace theory and certain other assumptions, it appears that all semantic interpretation can be done off surface structure, including case relations, for which deep structure is usually considered necessary. This article looks at semantic interpretation as it is considered in Jackendoff's "Semantic Interpretation in Generative Grammar" (1972) and shows how certain problems and inconsistencies of interpretation that arise in the case of adverbs, co-reference, scope of modal operators and thematic relations can be resolved if all interpretation is done off surface structure. The article also discusses how this might be achieved. (Author/CLK)

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Is it possible to do all Semantic Interpretation off Surface Structure? *

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Within the context of generative grammar, there are four main positions as regards semantic interpretation: in Standard Theory, all semantic interpretation is done off deep structure; in Generative Semantics, the base rules generate semantic representations directly; in Extended Standard Theory (EST), semantic interpretation must be done both at the level of deep and of surface structure. The fourth possibility is that all semantic interpretation should be done off surface structure. This could only be done given trace theory and some other assumptions which will be discussed below.

Arguing for EST, Chomsky (1968, 1972) and Jackendoff (1972) show that certain aspects of semantic interpretation must be done off surface structure. One argument concerns focus and presupposition and how they interact with intonation contours, which are not present in deep structure.

The focus of a sentence is that information which is assumed by the speaker not to be known by his hearer, while the presupposition is the information that speaker and listener share. To a question such as:

(1) Is it JOHN who writes poetry?

a natural response would be:

(2) No, it is BILL who writes poetry

and not:

(3) No, it is JOHN who writes short stories

The word with major stress (capitalized) is the focus. (2) is a suitable answer for (1) where 'John' is the focus; (3) would be suitable where the focus was 'that someone writes poetry'. Chomsky proposes that the focus is determined off surface structure and is the phrase which contains the main stress of the sentence. However, in cases like (1), it is also possible to argue that focus is determined at deep structure, being the

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predicate of the dominant proposition in deep structure. To show that this is not the case, Chomsky considers the following sentences:

(4)a. Was it an ex-convict with a red SHIRT that he was warned to look out for?

b. Was it a red-shirted ex-CONVICT that he was warned to look out for?

c. Was it an ex-convict with a shirt that is RED that he was warned to look out for?

All of these come from the following deep structure:

(5) the one [he was warned to look out for wh-someone] was X

A natural response to any of (4 a,b,c) would be:

(6) No, he was warned to look out for an automobile salesman

However, (7 a,b,c) are appropriate for (4 a,b,c) respectively and are not interchangeable:

(7)a. No, he was warned to look out for an ex-convict with a red TIE

b. No, he was warned to look out for a red-shirted AUTOMOBILE salesman

c. No, he was warned to look out for an ex-convict with a shirt that is GREEN

The predicate of the higher clause in these examples is not necessarily identical with focus and the lower clause is not identical with presupposition, as deep structure theories of semantic interpretation would claim. On the other hand, if focus refers to a phrase containing main stress, any of the following are candidates:

(8)a. an ex-convict with a red shirt

b. with a red shirt

c. a red shirt

d. shirt

Indeed, the focus need not correspond to any phrase of deep structure at all. Thus, in:

(9) Is John certain to win?

'win', 'to win' and 'certain to win' can each act as focus but 'certain to win' corresponds to no element of deep structure, assuming that the deep structure is:

(10) [John wins] is certain

Another area where Chomsky and Jackendoff argue for surface structure semantic interpretation concerns the scope of logical operators such as negation and quantifiers. Jackendoff shows that sentence and VP negation differ in meaning when there is a quantifier in the derived subject. In sentences like:

(11) Not many of the demonstrators were arrested by the police

(12) Many of the demonstrators weren't arrested by the police

the active form:

(13) The police didn't arrest many of the demonstrators

has a reading corresponding only to (11), the S negation, and not to (12), the VP negation. This can be demonstrated by adding an extra clause; only S negation shows contradiction:

(14)a. *Not many demonstrators were arrested by the police but many were

b. Many of the demonstrators weren't arrested by the police but many were

c. *The police didn't arrest many of the demonstrators but they did arrest many of them

The order of quantifier and negator is the same in (11) and (13). The meaning difference occurs with (12) where the order is reversed.

Other transformations that change the relative order of negation and a quantifier may also change meaning:

(15)a. Tom doesn't go to town very often

b. Not very often does Tom go to town

c. Very often Tom doesn't go to town

Here, (15c), with adverb preposing, differs in meaning from (15a) and (15b).

Neither Chomsky nor Jackendoff questions the need for deep structure interpretation of thematic relations. By arguments such as those above, they only seek to show that some semantic interpretation must be done off surface structure because it cannot be done off deep structure. It has now been suggested that thematic relations can also be recovered off surface structure, given trace theory and Goldsmith's (1975) proposal to deal with cases where trace theory cannot apply. I shall now consider aspects of Jackendoff's 'Semantic Interpretation in Generative Grammar' to see whether it is in fact possible to do all semantic interpretation in this way.

According to trace theory, any NP moved by a movement rule leaves a trace 't' in surface structure, which marks its original position. A trace is properly bound when the NP governing it (i.e. the NP which moved) is to the left of it and higher in the tree. A trace can be spelled out by being covered by lexical material. Any post-posing rule will leave a trace which is not properly bound. For example, in passive, agent post-posing leaves a trace not properly bound in subject position. However, this ill-bound trace is subsequently covered by the preposing of the object into subject position and so it does not surface.

Jackendoff proposes an analysis of adverbs whereby there are four different types, each with its own set of projection rules. Speaker-oriented adverbs tell one about the speaker's feelings about the sentence he is commenting on:

(16) Evidently, Horatio has lost his mind

Subject-oriented adverbs tell one something about the subject of the clause:

(17) Cleverly, John dropped his cup of coffee

Manner adverbs tell one the manner in which something was done:

(18) John dropped his cup of coffee clumsily

and the last group involves adverbs like 'merely' and 'utterly'. Adverbs can occur in various positions in sentences, determined by the structural descriptions of the projection rules.

The projection rules for adverbs do not logically have to be applied at deep structure; Jackendoff shows that at least some aspects are dependent on surface structure. In the case of subject-oriented adverbs, the adverb modifies the derived subject, not the deep subject, as can be seen below:

(19) The doctor cleverly has examined John

(20) John cleverly has been examined by the doctor

(21) Joe intentionally seduced Mary

(22) Mary intentionally has been seduced by Joe

There are cases of subject-oriented adverb interpretation, however, which lead Jackendoff to propose a cyclic application of the projection rules rather than interpretation off surface structure. Consider:

(23) John is believed cleverly to have been examined by the doctor

In this example, the adverb has the subject-oriented interpretation. But in this case 'John' is not the subject of the clause containing the adverb, having moved to a position in a higher clause. If the structural description of the projection rule for subject-oriented adverbs is to be able to mention the derived subject of the relevant clause, the rule must apply at a point in the cycle where 'John' is still within the same clause as the adverb, hence the need, Jackendoff feels, for cyclic application of the adverb projection rules.

However, this is a case where trace theory can allow surface structure interpretation. If it is accepted that twice-moved NPs leave traces in both positions (see Lightfoot, 1975), then we have the following surface structure for (23):

(24) John is believed t cleverly to have been examined t by the doctor

Now the second, left-most trace meets the structural description

for the adverb projection rule: it is an NP in position of subject of the relevant clause. The projection rule can apply to the trace and then 'John' and 't' can be shown to corefer, giving the correct reading, namely that it is John who was clever.

Manner adverbs, on the other hand, are interpreted on the deep structure subject, according to Jackendoff, because they do not exhibit a change of meaning when the subject moves:

(25) The doctor examined John carefully

(26) John was examined carefully by the doctor

Here, if all semantic interpretation is to be done off surface structure, trace theory will not help. In:

(27) John was examined t carefully by the doctor

the trace left by the deep subject, 'the doctor', has been spelled out by the preposing of 'John' into subject position and so cannot be used for interpretation. The trace that remains, left on the movement of 'John', is irrelevant here. However, Goldsmith has proposed that the agent in a by-phrase can be interpreted by an independent process. This is supported by the fact that nominals like:

(28) a sonata by Beethoven

must be interpreted with 'Beethoven' as agent although there is no underlying subject position. Jackendoff says 'manner adverbs attribute a manner to the deep subject (or possibly to the noun phrase functioning as thematic agent)'. If one takes the second part of this statement to be the case, and if Goldsmith's proposal for by-phrases works, then manner adverbs can be associated with agents in surface structure.

There seem to be no other problems in interpreting adverbs at surface. For example, Jackendoff shows that sentence adverbs are affected by subject-auxiliary inversion and surface order:

(29)a. Frank probably beat all his opponents

b. *Did Frank probably beat all his opponents?

(30)a. Evidently John carefully has left the room

b. *Evidently carefully John has left the room

I will not go into his arguments in detail here but it seems clear that with adverbs the main difficulty for surface interpretation is the case of manner adverbs and of certain instances of subject-oriented adverbs, as discussed above, and that these can be dealt with by trace theory and Goldsmith's proposal.

Another area which Jackendoff explores is coreference. He proposes that pronouns and reflexives are present in deep structure, not introduced transformationally, and that their antecedents are determined in the semantic component. He does this by setting up a table of coreference which explicitly expresses coreference relations between two NPs. After the table is completed, it is subject to well-formedness conditions that determine whether it is internally and externally consistent. Thus, in:

(31) John washed himself

the entry on the table will be:

(32) John coref himself

but for:

(33) John washed him

it will be:

(34) John -coref himself

For cases like:

(35) *John washed herself

the entry would be:

(36) John coref herself

and it would then be excluded by the well-formedness condition.

Jackendoff retains an interpretive version of the importance of 'precede' and 'command' for pronominalization. His version is:

(37) Enter in the table: NP^1 coref $\begin{bmatrix} NP^2 \\ +\ pro \end{bmatrix}$
unless NP^2 both precedes and commands NP^1 (optional)

Given this rule, the interpretive rule for pronominalization cannot apply to deep structure since rules like adverb preposing, etc, change the order of NP^1 and NP^2. Thus, in (38), 'he' and 'Jake' cannot be coreferential whereas in (39) they can be:

(38) *He left town after Jake robbed the bank

(39) After Jake robbed the bank, he left town

Similar situations occur with:

(40) *It disturbs her that Mary is pregnant

(41) That Mary is pregnant disturbs her

Jackendoff considers that the interpretive rule concerned with coreference must be cyclic, occurring at the end of each cycle. It must be the last rule in a cycle in order to follow rules which reorder NP^1 and NP^2. It must be cyclic in order to account for certain problems raised by reflexives. As Jackendoff says, 'the crucial cases in the cyclic analysis of reflexivization were the picture-noun examples. These examples showed that reflexivization always chooses as antecedent an NP on the lowest possible cycle. Thus we distinguished

(42) John saw a picture of himself

and

(43) *John saw Mary's picture of himself

by the fact that 'Mary' on the lower NP cycle has to serve as antecedent for reflexive'. However, (43) could correctly be rejected at surface structure without much difficulty. The reading:

(44)a. John -coref Mary

b. John coref himself

can be blocked at surface structure by Chomsky's (1973) Specified Subject Constraint, (SSC). In the case of:

(45) John told Bill a story about himself

the reading is ambiguous since there is no specified subject

and so both John and Bill can be coreferential with 'himself'. In the case of:

(46) John told Bill Harry's story about himself

the SSC prevents the readings of 'John' and 'Bill' as coreferential with 'himself' and only allows the reading with 'Harry' as coreferential, so that the sentence is not ambiguous.

Jackendoff gives another argument to support the suggestion that reflexive interpretation must be cyclic. In the following sentences:

(47) The fact that a picture of himself is hanging in the post office is believed by Mary to be disturbing Tom

(48) The fact that a picture of her(self) is hanging in the post office is believed by Mary to be disturbing Tom

(49) The fact that a picture of himself is hanging in the post office is believed by Max to be disturbing Tom

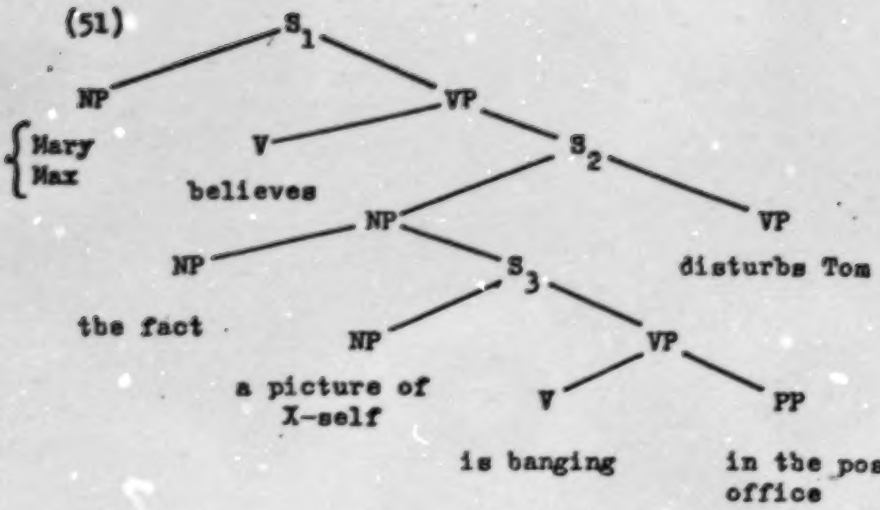
(50) *The fact that a picture of himself was hanging in the post office induced the police to arrest Tom

he feels that in (47) 'himself' refers to 'Tom', that in (48) 'her' is preferable to 'herself', while in (49) 'himself' refers to 'Tom' and not to 'Max'. He also adds 'furthermore, there is no structural way to distinguish (49) from (50) on the basis of surface structure'.

In the first place, I find that 'herself'is acceptable in (48) and that 'himself' can refer to either 'Max' or 'Tom' in (49). What is more, I think that this follows not only from a surface structure analysis but also from Jackendoff's cyclic analysis, in which case these sentences do not provide an illustration of the difference between reflexive as a cyclic interpretive rule and reflexive interpreted at surface structure.

The deep structure for (47), (48) and (49) would be as follows:

(51)



On the S_2 cycle, reflexivization does not apply. On the S_2 cycle, 'Tom' is encountered and can serve as NP_1. However, it does not have to do so since reflexivization is optional if NP_1 does not precede NP_2. If the option is taken, one gets the reading for (49) where 'Tom' is understood. If the option is not taken, on the final cycle 'Max' or 'Mary' are candidates for NP_1 and reflexivization is obligatory, giving the 'Max' reading for (49) and the 'herself' reading for (48).

It seems, then, that Jackendoff cannot explain his judgments about these sentences by rejecting surface structure interpretation, since the same problems arise with cyclic interpretation. His remark about (49) and (50) being structurally indistinguishable is also not true, given trace theory. (49) has a trace left by the movement of the complex NP, whereas (50) does not:

(52) The fact that a picture of himself is banging in the post office is believed t by Max to be disturbing Tom

However, it is not clear whether a trace from a complex NP would be useful for doing semantic interpretation at surface.

From the discussion so far, it appears that Jackendoff's need for cyclic application of coreference rules is not very great. Furthermore, he himself notes that his non-coreferentiality rule cannot be cyclic:

(53) If for any NP^1 and NP^2 in a sentence, there is no entry in the table $NP^1 \pm NP^2$, enter in the table NP^1 -coref NP^2. (Obligatory)

If it were cyclic, it would block the interpretation of:

(54) Who that Mary knew do you think she visited?

from:

(55) [You think [she visited who [that Mary knew]]]

by marking 'she' and 'Mary' distinct on the second cycle. It would seem appropriate, therefore, that both coreference and non-coreference should be marked at surface.

If cyclic interpetation rules are abandonned in favour of surface structure interpretation, the table of coreference can be made to refer to traces as NPs and coreference can be established between a trace and its antecedent. (See Wasow (1972) for details on how traces can be used to explain cross-over phenomena without resorting to movement rules sensitive to coreference).

Jackendoff examines the complement system and notes that the rule of complement subject deletion in cases like:

(56) Fred attempted to escape the snark

from

(57) Fred attempted [for Fred to escape the snark]

is incompatible with an interpretive theory of coreference since the rule requires identity of referential indices in its structural description i.e. it is a syntactic rule sensitive to semantic information. In order to bring complement subject deletion into line with other coreference situations such as pronominalization and reflexivization, he proposes that there are, in fact, no transformations producing deletion under identity. Rather, empty nodes, symbolized by Δ, are generated in deep structure. Rules of semantic interpretation give readings to empty nodes or combinations of them. If an empty node is not assigned a reading, the sentence is semantically ill-formed. Where Δ is a complement subject, it can be entered in the table of coreference, just like any other NP:

(58) Complement Subject Rule

Enter in the table of coreference: NP^1 α coref NP^2 if NP^2 is the subject of a for-to or poss-ing complement, NP^1 is in the main clause of the present cycle and NP^2 is α equal to Δ.
(Obligatory)

Thus, in:

(59) Mary told Bill that Δ helping herself could be difficult

the internally consistent table of coreference will be:

(60)

Δ coref herself	(reflexivization)
Mary coref Δ	(complement subject rule)
Mary coref herself	(pronominalization)
Bill -coref Bill -coref herself Bill -coref Mary	(non-coreferentiality rule)

Because Jackendoff generalizes the complement subject rule with the other coreference rules, he takes it to be cyclic. He shows the need for cyclicity with the following case:

(61) Max believes [that Mary finds it [Δ to be difficult [Δ to shave {*himself / herself / Bill}]]]

where he says that if two possible antecedents appear on different cycles, the one in the lower cycle is always chosen. The reflexive in (61) indicates that Δ is identical with 'Mary', the antecedent on the lower cycle. In fact, if the Δs appear at surface, the SSC will block the establishment of coreference between 'Max' and 'himself', leaving only one consistent table:

(62) Max -coref Mary
Mary coref Δ
Δ coref Δ
Δ coref herself

This analysis assumes that Δ appears in surface structure. Since an unrealized symbol 't' has already been allowed in surface structure, it does not seem unreasonable to allow another in the form of Δ, which clearly can occur in shallow structure in any case, since it occurs in passives, etc.

Jackendoff believes that there is a rule of raising and shows how this will apply to the interpretation of a Δ. Contrast the two structures:

(63) John expects [Δ to go]

(64) John expects Δ [to go]

In (64), where raising has applied, the cyclic complement subject rule is not applicable and the sentence would be rejected as ill-formed. If (64) is embedded in another clause, as in:

(65) Sam hoped [for John to expect Δ [to go]

passive can take place:

(66) $\left[_{S_1}\right.$ Sam hoped $\left[_{S_2}\right.$ for Δ to be expected by John $\left[_{S_3}\right.$ to go $\left.\right]\left.\right]\left.\right]$

Now, on the S_1 cycle, the complement subject rule can mark Δ coreferential with 'Sam', giving the correct reading:

(67) Sam hoped to be expected to go

However, if there is no raising rule and Δs are interpreted at surface, there is also no problem:

(68) Sam hoped for John to expect Δ to go

(69) Sam hoped Δ to be expected to go

The table of coreference will establish that 'John' is the antecedent of Δ in (68) and that 'Sam' is the antecedent in (69). The issue of raising is then irrelevant.

Given the existence of Δs and assuming them to be present in surface structure, one has a possible analysis of relative clauses in modern English introduced by 'that'. Grimshaw (1974) shows that in Middle English, NPs were deleted in that-relatives but moved in wh-relatives. For modern English,

it is usually thought that wh-movement is involved in both cases. However, if this is so, then, as Goldsmith points out, a trace is left in a that-relative which is not properly bound. In a sentence such as:

(70) The book that I read t is long

the trace's antecedent is the wh-word which has moved into COMP and subsequently been replaced by 'that', thus leaving an ill-bound trace but perfectly good sentence. If, instead, it is assumed that relative clauses also have Δs present in deep structure rather than deletions operating, as Jackendoff argues for other 'deletions' like complement subject, then the deep and surface structure for that-relatives can contain Δs. This means that relative clauses could have surface structures as follows:

(71) The book which I read t is boring

(72) The book that I read Δ is boring

(73) The book I read Δ is boring (by that-deletion)

Then all relative clauses can be interpreted by the coreference rules. In (71), they will apply to show that 'book'=wh-t, in (72) and (73) to show that 'book'= Δ. Bach (McGill lecture, 1976) proposes that the fact that there are two derivations of relative clauses in modern English would mean the need for two different semantic interpretation rules in EST and that this would fail to capture a generalization about relative clauses. However, in the above cases, one rule, coreference, is involved, though two symbols are necessary, both of which are independently motivated.

To turn to another area which Jackendoff discusses in his book, namely the modal operators, in a sentence such as:

(74) John wants to catch a fish

there is ambiguity between a specific reading and a nonspecific one for 'a fish'. To explain this, Jackendoff proposes a class of modal operators: unrealized, future, possible, negative, multiple, generic and wh. Lexical items containing modal operators can be of virtually any syntactic category. Associated with each lexical item bearing a modal operator is the structural relation called the 'scope' of the operator. Jackendoff distinguishes three kinds of scope: Type I, associated with verbs like

'want', 'hope' and 'expect' consists of one of the NPs which is strictly subcategorized by the lexical item containing the modal operator. In (74) above, 'want' (type I scope) carries the modal operator'unrealized'. If the following NP depends on 'want', the nonspecific reading, where there is an identifiable fish only in the event that John actually catches one, is understood. An NP within the scope of the operator is only optionally dependent on it, so the specific reading can result if the modal projection rule is not applied.

Type II scope, associated with modal verbs such as 'will' and 'may', consists of everything commanded by the lexical item containing the modal operator. For example:

(75) A unicorn will appear on your doorstep tomorrow

has 'a unicorn' ambiguous as to specificity, whereas:

(76) A girl said that Bill will see a unicorn

has ambiguity applying to 'a unicorn' but not to 'a girl', since the latter is not in the clause commanded by 'will'.

Type III scope, involving determiners, quantifiers and negators, consists of all material commanded by and to the right of the lexical item containing the operator. Thus:

(77) John didn't see a man catch a fish

can have both 'a man' and 'a fish' as nonspecific.

The major point of interest here is that Jackendoff proposes that type I scope must be determined off deep structure, that type III must be determined off surface structure (as shown by the arguments about negation and quantifiers outlined on pages 3 and 4) and that type II can be determined off either. The reason why he feels that type I scope must be determined at deep structure is that with verbs such as 'want' and 'expect', an NP can be moved but still remains within the scope of the verb i.e. it still retains its nonspecifity:

(78) A unicorn is expected to appear pretty soon

(79) A Rembrandt, Bill wants very much to see

However, this is precisely the sort of situation where traces will allow a surface structure interpretation. With traces,

(78) and (79) become, respectively,:

(80) A unicorn is expected t to appear pretty soon

(81) A Rembrandt, Bill wants very much to see t

It is, therefore, apparent at surface what the position of the NPs was within the scope of these operators and the readings can be done off the traces. This means that the projection rule for modal operators can now work off surface structure for all types of scope, rather than having to work off two levels as Jackendoff proposes.

There still remains for any attempt at doing semantic interpretation at surface the crucial issue of thematic relations. Both Chomsky and Jackendoff feel that these must be determined at deep structure.

Grammatical relations in deep structure do not express certain semantic facts. Thus, in:

(82) The door opened

(83) Charlie opened the door

'the door' is subject of (82) but object of (83) and yet it has the same semantic function in both. Jackendoff, therefore, proposes a system of thematic relations to account for semantic functions. In every sentence, there is an NP functioning as Theme. With verbs of motion, the Theme is defined as the NP understood to be undergoing the motion:

(84) The rock moved away

(85) Harry gave the book away

(86) Dave explained the proof to his students

With verbs of location, it is the NP whose location is being asserted:

(87) The rock stood in the corner

(88) Herman kept the book

(89) Max knows the answer

Another thematic relation is Location, which is associated with the NP expressing the location in a sentence with a verb of motion:

(90) John stayed in the room

Adjectives can function as abstract locations:

(91) John stayed angry

Source and Goal are associated with verbs of motion:

(92) Harry went from Bloomington to Boston

(93) Harry went from elated to depressed

The final thematic relation of interest to Jackendoff is Agent. The Agent NP is identified by a semantic reading which attributes will or volition to the NP toward the action expressed by the sentence. Only animate NPs can function as agents:

(94) John took the book

(95) The book was taken by John

The semantic component, according to Jackendoff, derives the thematic relations of a sentence from deep structure. Since the verb is what determines the relationship, the lexical entry of the verb must correlate grammatical and thematic relations. Since most of the work of handling thematic relations is done in the lexicon, one can ask whether the projection rules could apply directly to surface structure rather than to deep structure. In the case of Theme, Location, Source and Goal, this does not seem to be impossible. Firstly, if NPs with any of these thematic relations are moved, they will leave a trace:

(96) The book was given away t by Harry

If 'give' is marked in the lexicon as taking an object NP as Theme, the trace can serve to fulfil that requirement of the lexical entry.

Secondly, thematic relations are often marked by a preposition in surface structure, for instance: 'in' marks Location, 'from' marks Source and 'to' marks Goal. So if a PP is moved, which does not leave a trace, the thematic relation is still recoverable from the preposition:

(97) In the room John stayed

A problem does arise with adjectives functioning as abstract thematic relations. If such an adjective is moved, how is its thematic relation to be recovered at surface? For example, in:

(98) Angry though John remained

'angry', the abstract Location, is not in the position subcategorized by the verb and nothing marks it as having been there.

Jackendoff considers some cases to be ambiguous or difficult to decide, for instance:

(99) The circle contains the dot

Such cases, however, if they are ambiguous at all, are so both at deep and surface structure and so cannot be used to argue for or against either position.

In the case of Agent, certain adverbs and adverb clauses may occur at surface such as 'intentionally', 'in order to', etc. These are particularly useful for marking Agent if the verb does not mark one of its arguments as Agent in the lexicon:

(100) Tom intentionally struck Bill as rude

(101) Willy was examined by the doctor in order to prove to his uncle that he didn't have rickets

((100), which seems somewhat doubtful, is given by Jackendoff as an acceptable sentence). In (100), 'Tom' would not normally get an Agent reading and in (101) 'Willy' would not, but the presence of adverb and adverb clause gives them Agent status.

With Agents which occur in passives, such as:

(102) The store was raided by the police

the trace left in subject position by the movement of 'the police' is subsequently covered and so cannot by used to interpret the Agent relation. However, Goldsmith's proposal (discussed on page 5) allows the Agent in a by-phrase to be interpreted independently of its previous position in the sentence, which means that Agent, like the other thematic relations, can be interpreted at surface structure.[1]

In conclusion, it seems that all semantic interpretation can be done off surface structure, given trace theory and the independent recoverability of Agenthood. As far as thematic relations are concerned, the only problem concerns those thematic relations which are expressed in adjectives rather than NPs. Outside this area, the major issue is whether Δs occur in surface structure; if they do, all coreference interpretation can be done at surface too.

FOOTNOTES

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1. Goldsmith himself produces a counter-argument to his proposal that thematic relations can be determined at surface. This concerns the sentence:

(i) Les propositions qu'a faites Rockerfeller hier etaient des bêtises

from:

(ii) Les propositions COMP Rockerfeller a fait lesquelles hier etaient des bêtises

by wh-movement of 'lesquelles' and deletion of 'wh'. This leaves an unbound trace. 'Que' is then inserted and subject-postposing applies, deleting the first trace but leaving another, ill-bound but grammatical. The second trace allows elision: 'qu'a' - unlike traces which block 'wanna' in English (see Lightfoot, 1975). The problem, as Goldsmith states it, is: 'we have several strong cases of subject-to-object demotion in French. If these rules leave traces, they are serious counter-examples to the trace theory of movement. If they do not leave traces, they are serious counter-examples to the hypothesis that grammatical relations are determined at surface'. In (i), 'the 'real' direct object, les propositions, has superficially nothing to do with the post-verbal position and ..... the 'real' subject, Rockerfeller, has nothing superficially to do with the pre-verbal position'.

While this may be a problem for French, it is not clear that it is necessarily one for English.

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